

AMENDMENTS TO THE CLAIMS

The listing of claims will replace all prior versions and listings of claims in the application. Applicant has canceled Claims 1-22 without prejudice and added new Claims 23-47 as follows:

1-22. (Canceled)

23. (New) A method of processing an iris image data, the method comprising:

providing data representing an image of an iris of an eye;

segmentizing the data into a plurality of segment datas, which comprises a first segment data representing a first segment of the image;

performing a wavelet transform on the first segment data, thereby producing a wavelet representation of the first segment data;

further segmentizing the first segment data into a plurality of subsegment datas, which comprises a first subsegment data representing a first subsegment of the image, the first subsegment being a part of the first segment; and

performing a wavelet transform on the first subsegment data, thereby producing a wavelet representation of the first subsegment data.

24. (New) The method of Claim 23, wherein, prior to further segmentizing the first segment data, the method further comprises determining to further segmentize the first segment data based on the wavelet representation of the first segment data.

25. (New) The method of Claim 23, wherein the plurality of segment datas further comprises a second segment data representing a second segment of the image other than the first segment, and wherein the method further comprises performing a wavelet transform on the second segment data, thereby producing a wavelet representation of the second segment data.

26. (New) The method of Claim 25, wherein, subsequent to performing the wavelet transform on the second segment data, the method further comprises determining not to segmentize the second segment data based on the wavelet representation of the second segment data, and wherein the first segment comprises more information on iris pattern than the second segment.

27. (New) The method of Claim 25, wherein, the method further comprises determining whether to segmentize the first segment data and the second segment data, wherein

the method selects the first segment data for segmentizing while not selecting the second segment data for segmentizing, and wherein the wavelet representation of the first segment data has more low frequency components than the wavelet representation of the second segment data.

28. (New) The method of Claim 23, wherein the wavelet transform on the first segment data or the first subsegment data comprises a Daubechies wavelet transform.

29. (New) The method of Claim 23, wherein the method further comprises performing a wavelet transform on the others of the plurality of subsegment datas in addition to the wavelet transform of the first subsegment data, thereby producing wavelet representations of the others of the first subsegment data, and wherein each of the plurality of subsegment datas represents a portion of the first segment of the image.

30. (New) The method of Claim 29, further comprising determining whether to further segmentize each of the plurality of subsegment datas into a plurality of data pieces based on the wavelet representations of the plurality of subsegment datas, wherein each wavelet representation comprises frequency components.

31. (New) The method of Claim 30, wherein determining comprises characterizing the wavelet representations based on the frequency components thereof in two perpendicular directions on an image of the first segment.

32. (New) The method of Claim 31, wherein the wavelet representations are characterized as one of HH, HL, LH and LL, wherein HH represents high frequency components in a first direction and a second direction on the image of the first segment, the first and second directions being perpendicular to each other, wherein HL represents a high frequency component in the first direction and a low frequency component in the second direction, wherein LH represents a low frequency component in the first direction and a high frequency component in the second direction, and wherein LL represents low frequency components in the first and second directions.

33. (New) The method of Claim 32, wherein determining to further segmentize subsegment datas, the wavelet representations of which are characterized as LL.

34. (New) The method of Claim 32, further comprising creating a characteristic vector of the iris image, wherein the characteristic vector comprises information of at least one of the plurality of subsegment data that is characterized as HH.

35. (New) The method of Claim 34, wherein the characteristic vector comprises information of a data segment characterized as LL.

36. (New) The method of Claim 23, further comprising creating a characteristic vector of the iris image, wherein the characteristic vector comprises information of at least one of the plurality of segment datas.

37. (New) The method of Claim 36, further comprising quantitizing values of the characteristic vector.

38. (New) The method of Claim 36, further comprising processing the characteristic vector to determine whether the iris image matches a pre-registered iris image.

39. (New) The method of Claim 38, wherein the characteristic vector is processed together with a characteristic vector of the pre-registered iris image to produce an inner product of the characteristic vectors.

40. (New) The method of Claim 38, wherein the iris image is determined to match the pre-registered iris image when an inner product of the characteristic vector and a characteristic vector of the pre-registered iris image is greater than a predetermined threshold value.

41. (New) The method of Claim 23, further comprising repeating a segmentization and a subsequent wavelet transform prior to the next segmentization, wherein in each repetition, the segmentization segmentizes a piece of data into a plurality of smaller pieces of data, the piece of data representing a piece of the image, each smaller piece of data represents a portion of the piece of the image, wherein in each repetition, the wavelet transform is performed on each segmentized piece of data.

42. (New) The method of Claim 41, wherein repeating the segmentization and wavelet transform a predetermined number of times, wherein the total number of wavelet transforms on datas comprising representation of a position in the image is from 2 to 7.

43. (New) A device for use in processing iris image data, comprising:
means for providing data representing an image of an iris of an eye;
means for segmentizing the data into a plurality of segment datas, which comprises a first segment data representing a first segment of the image;

means for performing a wavelet transform on the first segment data, thereby producing a wavelet representation of the first segment data;

means for segmentizing the first segment data into a plurality of subsegment datas, which comprises a first subsegment data representing a first subsegment of the image, the first subsegment is a part of the first segment; and

means for performing a wavelet transform on the first subsegment data, thereby producing a wavelet representation of the first subsegment data.

44. (New) The device of Claim 44, further comprising means for creating a characteristic vector of the iris image, wherein the characteristic vector comprises information of at least one of the plurality of segment datas.

45. (New) The device of Claim 44, further comprising means for processing the characteristic vector to determine whether the iris image matches a pre-registered iris image.

46. (New) A device for processing iris image data, comprising
an input module configured to receive data representing an image of an iris of an eye; and

an iris image processing module configured to perform the method of Claim 36;
and

47. (New) A security system comprising:
the iris image data processing device of Claim 46; and
an image matching module configured to process the characteristic vector to determine whether the iris image matches a pre-registered iris image.